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A NEW SPECIES OF *HYDROPSYCHE* (TRICHOPTERA: HYDROPSYCHIDAE) FROM ALABAMA, WITH NOTES ON *H. FRISONI* ROSS AND AN UNUSUAL *HYDROPSYCHE* FROM FLORIDA

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Abstract.—***Hydropsyche fenestra*, n. sp.**, belonging to the *scalaris* group and collected in central Alabama, is described and illustrated. Variation in *Hydropsyche frisoni* Ross is discussed with illustrations provided to facilitate identifications. In addition, figures of a deformed *Hydropsyche* from northern Florida, which appears to represent an undescribed species, are presented.

Key Words: Hydropsychidae, *Hydropsyche scalaris* group, Alabama, Florida

The genus *Hydropsyche* is well represented in the southeastern United States, with 24 species reported, or about half of all known North American members of the genus. Our ongoing caddisfly studies in the region have uncovered a distinctive new species from Alabama, where 23 species have been previously recorded (Harris et al. 1991). The new species was collected in the west-central part of the state near the juncture of the Cumberland Plateau and East Gulf Coastal Plain physiographic provinces.

A second *Hydropsyche* encountered in our Alabama collections, *Hydropsyche frisoni* Ross, appeared to show distinct differences from the Illinois specimens illustrated by Ross (1944). After examining over a thousand specimens from Alabama, we decided that either the Alabama material represented a new, but closely related, species or that *H. frisoni* exhibited considerable variation. Since Alabama represents the southernmost range of this species, either of the above scenarios seemed reasonable. After examining the holotype and numerous paratypes of *H. frisoni*, we concluded that we were dealing with one variable species. By providing additional illustrations, we hope to facilitate the identification of *H. frisoni* in the southeastern United States.

Finally, in processing a number of caddisfly collections taken by Andy Rasmussen in the panhandle region of Florida, we encountered two specimens of a deformed *Hydropsyche* that appear to represent a new species. The male specimens were unusual in that one side of the genitalic structures were entire; the other side appeared contorted and malformed. With no complete individuals, we are unwilling to assign a species name at this time. We have, however, provided illustrations and a brief description hoping this might assist recognition as additional material becomes available.

Morphological terminology follows that of Schmid (1980). The holotype of the new species will be deposited in the National Museum of Natural History,

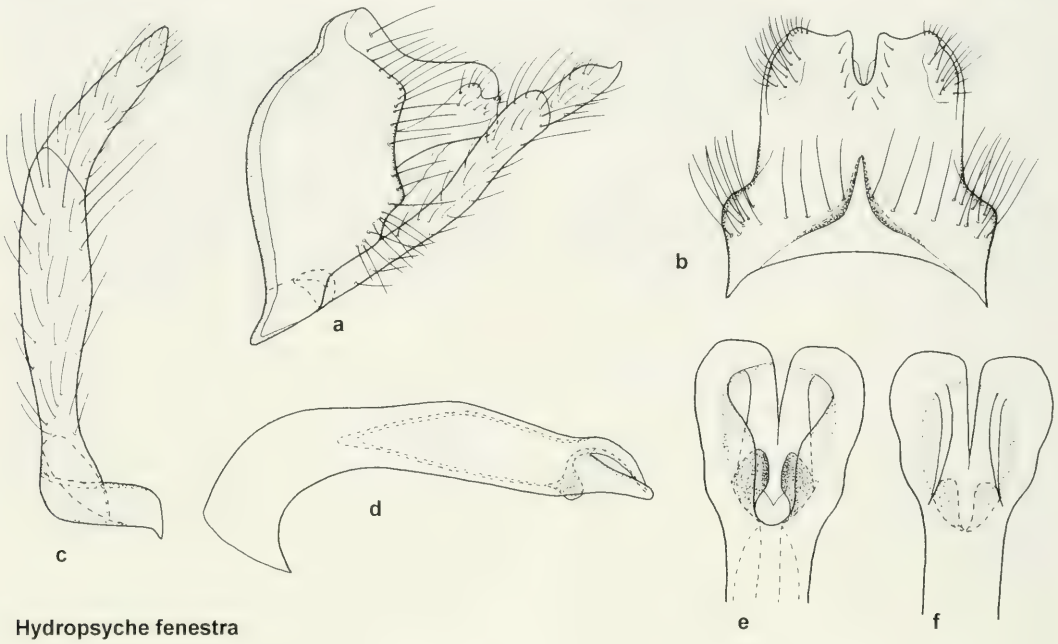

Fig. 1. *Hydropsyche fenestra*, male terminalia. a, Lateral view. b, Tergum IX & X, dorsal view. c, Inferior appendage, caudal view. d, Apex of phallic apparatus, ventral view. f, Apex of phallic apparatus, dorsal view.

Washington, DC. The specimens of the Florida *Hydropsyche* are deposited in the personal collection of S. C. Harris at Clarion University, PA. Type material of *Hydropsyche frisoni* are deposited at the Illinois Natural History Survey, Champaign, IL. Additional material is deposited in the collections of the authors.

Hydropsyche fenestra Lago and Harris, new species

(Fig. 1)

Holotype.—Male. Alabama: Tuscaloosa County, Big Sandy Creek off Co. Hwy 59, on Gulf States Power property, 6 km S. Coaling, 16 August 1991, S. Harris (NMNH).

Male.—Forewing length 10.2 mm, yellowish brown in alcohol. Wings mottled with yellowish spots on brown background, spots larger and coalescing, causing the wing to appear lighter, in apical half. Eyes, in dorsal view, more than half as wide as interocular distance (2:3.5). Abdominal segment IX with pronounced median dorsal crest. Tergum X with dorsoapical corner bluntly rounded in lateral view, apex truncate; apex in dorsal view with parallel sided, rather shallow notch; preanal appendage appears as a triangular setiferous wart near posteroventral corner. Inferior appendage, in caudal aspect, with basal segment moderately long and straight; apical segment relatively long, nearly one-half as long as base (3:7) and angled mesad, tapering slightly from base to apex; in lateral view, basal segment tapering from narrow base to broader apex; apical segment gradually enlarged in basal half, then abruptly tapering to acute, upturned point. Phallic apparatus tubular, straight in ventral view and distinctly constricted before apex, this constriction also apparent in lateral view; apex wider than phallobase, with lateral lobes evenly tapered apically and with ventral edge very slightly sinuate and

concave; lateral flange upturned slightly; mesal dome strongly arched and ending before apex of lateral lobe; mesal cavity deep, about 80% open ventrally.

Female.—Unknown.

Etymology.—Latin, *fenestra* (window), referring to the unusual "window" seen between the lateral lobes and the top of the mesal dome of the phallic apex.

Discussion.—The highly arched mesal dome will separate *H. fenestra* from other species of the *scalaris* group, except *H. frisoni*. Beyond this character, there is little *fenestra* has in common with the latter. The notched apex of tergum X (dorsal view) actually resembles that of *H. rossi* Flint, Voshell and Parker, as does the general shape of the lateral phallic lobes. However, in lateral view, the thickened dorsal walls of the mesal dome contact the lateral lobes much like a curved forefinger and straight thumb meeting, leaving a thin walled "window" between them. Within the *scalaris* species group, this configuration is unique to *H. fenestra*.

Hydropsyche frisoni Ross
(Fig. 2)

Hydropsyche frisoni was described from Illinois by Ross (1938). Since that time, the species has been reported from numerous central states, ranging from Minnesota and Michigan, south to Alabama (Harris *et al.* 1991). Recent concern about the accuracy of our initial identification of this species led us to examine individuals belonging to the type series, and based on our comparisons, we concluded that Alabama specimens do, indeed, represent *H. frisoni*. The differences apparent to us initially faded during the re-examination of nearly 170 specimens collected from northern Alabama. In order to facilitate recognition of this species, it seemed appropriate to detail some of the variation that first brought our attention to these specimens. Fig. 2 provides critical views of both Alabama and Illinois specimens. The following notes on variation were made. Variation in size is quite apparent within the Alabama series re-examined. Forewing length varies from 7.7 to 9.9 mm, with a mean of 9.0 (n = 86). In dorsal view, the apex of tergum X is rounded, lacking lateral corners in Alabama specimens, but almost squarely truncate in Illinois specimens, and with a fairly deep, tapering, rounded notch medially, which extends approximately ¼ to ⅓ the length of tergum X. The notch is relatively longer in southern specimens. The preanal appendage are somewhat longer than wide and distinctly emarginate on dorsoposterior corner in most Alabama specimens, but more nearly rounded and irregularly emarginate to evenly margined dorsally in northern specimens. The apex of the phallic apparatus has the mesal dome strongly arched throughout the range of the species, but somewhat more strongly so in southern specimens, with the mesal plates extending as small rounded lobes posteriorly (lateral view—the individual illustrated in Fig. 2 d-A shows maximum development of this character) in better developed Alabama specimens. No Illinois specimens examined have this posterior development of the mesal plates. In dorsal view, the mesal plates are gradually and distinctly expanded basally, together nearly teardrop shaped. Variation occurs in the width of these plates, but this did not seem to be correlated with range. The edges of the ventral cavity are evenly rounded in most specimens, but are slightly angulated in some Alabama specimens.

Material examined.—Holotype. IL: Oakland, along Salt Fork River, 24 April 1925, T. Frison, ♂; paratypes: same locality, 6 July 1927, T. Frison, 5 ♂.

AL: Bibb Co. Little Cahaba River @ Bulldog Bend, 13 May 1981, S.C. Harris,

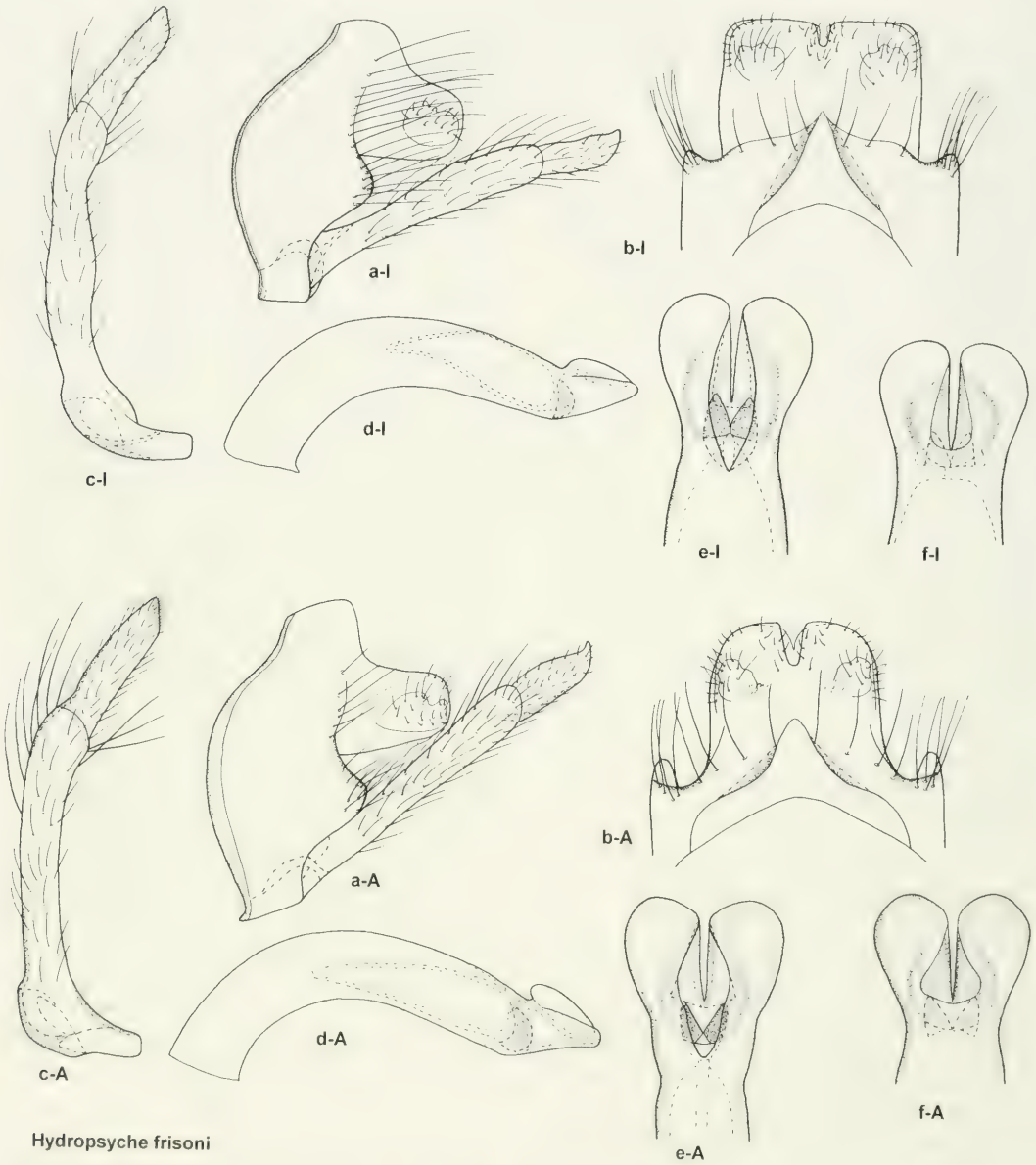

Fig. 2. *Hydropsyche frisoni*, male terminalia. A = Alabama, I = Illinois. a, Lateral view. b, Tergum IX & X, dorsal view. c, Inferior appendage, caudal view. d, Apex of phallic apparatus, ventral view. f, Apex of phallic apparatus, dorsal view.

P. O'Neal, 46 ♂; same location, 12 Sept. 1981, S.C. Harris, P. O'Neal, 15 ♂ same location, 10 May 1982, S.C. Harris, 4 ♂; Little Schultz Creek @ Schultz Creek Church, 6.6 mi N Centerville, S.C. Harris, 1 ♂; same location, 13 April 1982, S.C. Harris, 17 ♂; Blount Co. Locust Fork @ Cleveland, 15 May 1988, P. O'Neal, T. Shepard, 38 ♂; Jefferson Co. Cahaba River @ Camp Coffman, 24 May 1981, S.C. Harris, P. O'Neal, 15 ♂; same locality, 13 Sept. 1981, S.C. Harris, P. O'Neal, 1 ♂; Turkey Creek nr. Morris, 26 June 1985, P. O'Neal, 15 ♂;

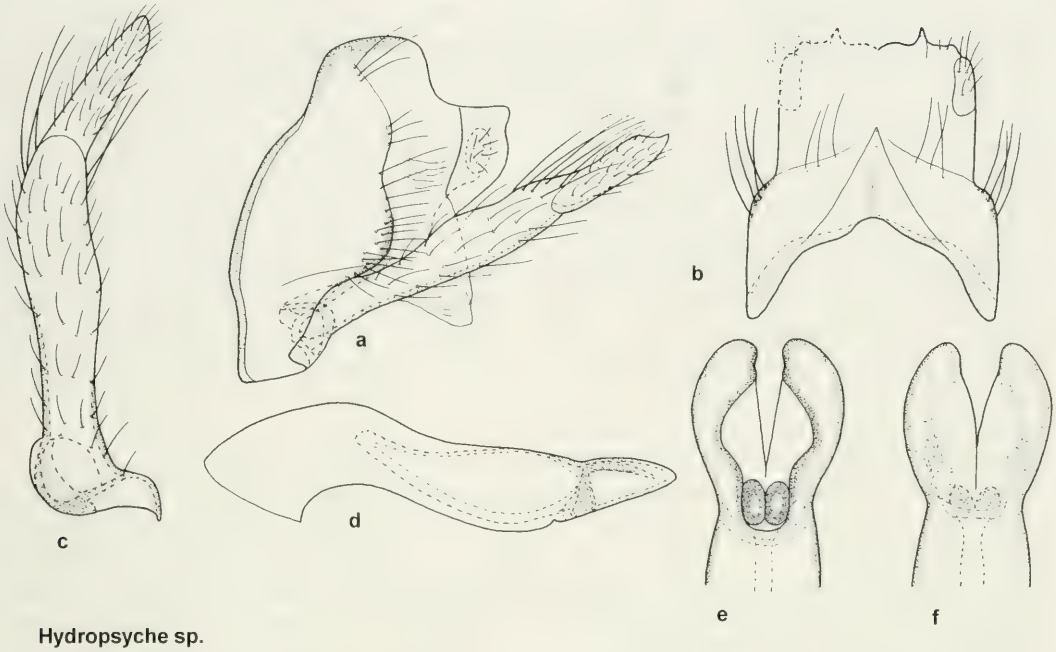

Fig. 3. *Hydropsyche* sp., male terminalia. a, Lateral view. b, Tergum IX & X, dorsal view. c, Inferior appendage, caudal view. d, Apex of phallic apparatus, ventral view. f, Apex of phallic apparatus, dorsal view.

Tuscaloosa Co. Mud Creek @ Tannahill State Park, 20 June 1991, S.C. Harris, 13 ♂; Shelby Co. Cahaba River @ Helena, 17 Sept. 1991, S.C. Harris, 9 ♂.

Hydropsyche sp.
(Fig. 3)

During a recent survey of caddisflies conducted at the Apalachicola Bluffs and Ravine Preserve, Liberty County, Florida, two specimens of an unrecognized species of *Hydropsyche* (*scalaris* group) were collected, one in May, the other in October. The specimens, both males, were deformed on the right side of the abdominal apex, the deformity affecting the inferior appendage and the tergum of the tenth segment. The left side in both cases, however, was intact, as was the phallic apparatus in each. The two specimens bear only vague resemblance to the only additional members of the *scalaris* group known to occur in the area, *Hydropsyche incommoda* Hagen and *H. rossi* (A. Rasmussen, personal communication).

Male.—Forewing length 10 mm, mottled yellowish brown in alcohol, with region between R_{2+3} an M_1 nearly devoid of brownish coloration, except distally, thus producing a clear window. Eyes, in dorsal view, half as wide as interocular width. Abdominal segment IX with pronounced median dorsal crest. Tergum X somewhat difficult to describe because of deformity, but left side in best developed specimen with dorsal apical corner rounded in lateral view giving the impression that a median cleft exists (similar to the condition seen in various members of the group, such as *H. scalaris* Hagen and *H. frisoni*); preanal appendage appears as a rounded setiferous wart near posteroventral corner. Inferior appendage, in caudal view, with basal segment moderately long and straight, slightly enlarged apically, apical segment rounded apically and one-third

length of base; in lateral view, basal segment tapering from narrow base to broader apex, apical segment slightly constricted in basal half, apical half evenly convex on posterior margin and diagonally truncate on anterior margin, tapering to distinct point. Phallic apparatus tubular, nearly straight in ventral view, phallobase slightly inflated in apical two-thirds and distinctly constricted before apex; in lateral view, sinuate, swollen ventrally before apex; apex approximately as wide as phallobase; lateral lobes tapered apically, slightly convex on dorsal surface, straight ventrally, without mesal dome, mesal cavity very deep, approximately 85% open ventrally.

Discussion.—Although obviously belonging to the *scalaris* group, these specimens do not resemble to any extent previously described species, and we believe they represent a new species. There is a temptation to simply dismiss the specimens as deformed individuals of *H. incommoda*, the species most commonly collected in the study area, based on the shape of tergum X and the inferior appendages. The length proportions of the inferior appendage segments are, however, quite different, being 4 : 1 in *H. incommoda* and 3 : 1 in the deformed individuals. Differences in phallic structure are also apparent, with the phallobase being somewhat more sinuous in the deformed specimens (compare Fig. 3 with Fig. 11 in Flint, et al. 1979). The mesal cavity in *H. incommoda* is shallow, but is very deep in the specimens in question; however, the ventral opening does not differ significantly in either shape or extent to which it is open. Hopefully, specimens without deformities will be obtained through continued collecting in the area and the identity of these unusual individuals can be ascertained.

Material examined.—FL: Liberty Co. Little Sweetwater Creek, Apalachicola Bluffs and Ravine Preserve, 5 km N. Bristol, N30.2821-W84.5908, 26 Oct 1995, M. Pescador, A. Rasmussen, 1 ♂; same locality, but label includes "site 6," 19 May 1994, M. Pescador, A. Rasmussen, S.C. Harris, 1 ♂.

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